

CLAIMS

What is claimed is:

1. A modular plasma arc torch comprising:

a torch head;

a torch lead; and

a quick disconnect operatively engaged between the torch head and the torch lead,

wherein the torch head is removably connected to the torch lead through the quick disconnect such that the torch head and the torch lead may be quickly assembled and disassembled.

2. The modular plasma arc torch according to Claim 1, wherein the quick disconnect comprises:

a pin fitting; and

a socket adapter,

wherein the pin fitting is engaged within the socket adapter such that gas and electric power are conducted through the quick disconnect.

3. The modular plasma arc torch according to Claim 2, wherein:

the pin fitting further comprises a plurality of resilient fingers defining a proximal end and a plurality of contact flanges disposed at the proximal end of the resilient fingers; and

the socket adapter further comprises a socket housing and a socket fitting disposed within the socket housing,

wherein the contact flanges engage the socket fitting to provide electrical contact for supply of the electric power.

4. The modular plasma arc torch according to Claim 3, wherein the socket housing further comprises a tapered internal shoulder that causes the resilient fingers to deflect radially inward for engagement of the contact flanges with the socket fitting.

5. The modular plasma arc torch according to Claim 4, wherein the socket housing further comprises radial bores disposed adjacent the tapered internal shoulder that cause the socket housing to fracture should an object other than the pin fitting be inadvertently forced into the socket adapter.

6. The modular plasma arc torch according to Claim 3, wherein the socket fitting defines a distal internal bore such that the contact flanges engage the distal internal bore for the electrical contact.

7. The modular plasma arc torch according to Claim 6 further comprising a sleeve disposed within the distal internal bore to limit engagement of the contact flanges with the distal internal bore and to facilitate disengagement of the pin fitting from the socket adapter.

8. The modular plasma arc torch according to Claim 3 further comprising a plug disposed on a shoulder formed within the socket fitting, wherein the plug inhibits electrical contact of an object inadvertently inserted within the socket adapter with the socket fitting.

9. The modular plasma arc torch according to Claim 3 further comprising a snap ring disposed around the socket fitting to secure the socket fitting within the socket housing.

10. The modular plasma arc torch according to Claim 3 further comprising at least one o-ring disposed between the socket housing and the socket fitting to seal a supply of gas.

11. The modular plasma arc torch according to Claim 3 further comprising at least one o-ring disposed between the pin fitting and the socket housing to seal a supply of gas.

12. The modular plasma arc torch according to Claim 2, wherein the socket housing further comprises a threaded extension and the torch head further comprises a threaded member, such that when the pin fitting is fully engaged within the socket adapter, the threaded extension threadably engages the threaded member to further secure the torch head to the torch lead.

13. The modular plasma arc torch according to Claim 2 further comprising a torch handle defining positioning ribs, wherein the positioning ribs further secure the torch head to the torch lead.

14. The modular plasma arc torch according to Claim 2, wherein the pin fitting defines an internal bore and the socket fitting defines a distal internal bore and a proximal internal bore, wherein the pin fitting internal bore, the distal internal bore, and the proximal internal bore are in fluid communication to conduct the gas through the quick disconnect.

15. A modular plasma arc torch comprising:
- a torch head;
 - a gas control device;
 - a first quick disconnect operatively engaged between the torch head and the gas control device;
 - a torch lead; and
 - a second quick disconnect operatively engaged between the gas control device and the torch lead,

wherein the torch head is removably connected to the gas control device through the first quick disconnect and the gas control device is removably connected to the torch lead through the second quick disconnect such that the torch head, the gas control device, and the torch lead may be quickly assembled and disassembled.

16. The modular plasma arc torch according to Claim 15, wherein:

the first quick disconnect comprises:

a first pin fitting; and

a first socket adapter; and

the second quick disconnect comprises:

a second pin fitting; and

a second socket adapter,

wherein the first pin fitting is engaged within the first socket adapter, and the second pin fitting is engaged within the second socket adapter, such that gas and electric power are conducted through the first quick disconnect and the second quick disconnect.

17. The modular plasma arc torch according to Claim 16, wherein:

the first pin fitting and the second pin fitting further comprise a plurality of resilient fingers defining a proximal end and a plurality of contact flanges disposed at the proximal end of the resilient fingers;

the first socket adapter further comprises a first socket housing and a first socket fitting disposed within the first socket housing; and

the second socket adapter further comprises a second socket housing and a second socket fitting disposed within the second socket housing,

wherein the contact flanges engage the socket fittings to provide electrical contact for supply of the electric power.

18. The modular plasma arc torch according to Claim 17, wherein the first and second socket housings further comprise a tapered internal shoulder that causes the resilient fingers to deflect radially inward for engagement of the contact flanges with the socket fittings.

19. The modular plasma arc torch according to Claim 18, wherein the socket housings further comprise radial bores disposed adjacent the tapered internal shoulders that cause the socket housings to fracture should objects other than the pin fittings be inadvertently forced into the socket adapters.

20. The modular plasma arc torch according to Claim 17, wherein the first and second socket fittings define distal internal bores such that the contact flanges engage the distal internal bores for the electrical contact.

21. The modular plasma arc torch according to Claim 20 further comprising first and second sleeves disposed within the distal internal bores to limit engagement of the contact flanges with the distal internal bores and to facilitate disengagement of the pin fittings from the socket adapters.

22. The modular plasma arc torch according to Claim 17 further comprising a first plug disposed on a shoulder formed within the first socket fitting, and a second plug disposed on a shoulder formed within the second socket fitting, wherein the plug inhibits electrical contact of objects inadvertently inserted within the socket adapters with the socket fittings.

23. The modular plasma arc torch according to Claim 17 further comprising snap rings disposed around the socket fittings to secure the socket fittings within the socket housings.

24. The modular plasma arc torch according to Claim 17 further comprising:

a first o-ring disposed between the first socket housing and the first socket fitting; and

a second o-ring disposed between the second socket housing and the second socket fitting,

wherein the o-rings provide gas-sealed interfaces between the socket housings and the socket fittings.

25. The modular plasma arc torch according to Claim 17 further comprising:

a first pin fitting o-ring disposed between the first pin fitting and the first socket housing; and

a second pin fitting o-ring disposed between the second pin fitting and the second socket housing,

wherein the o-rings provide gas-sealed interfaces between the pin fittings and the socket housings.

26. The modular plasma arc torch according to Claim 17, wherein:

the first socket housing further comprises a first threaded extension;

the second socket housing further comprises a second threaded extension;

the torch head further comprises a first threaded member, such that when the first pin fitting is fully engaged within the first socket adapter, the first threaded extension threadably engages the first threaded member to further secure the torch head to the gas control device; and

the gas control device further comprises a second threaded member, such that when the second pin fitting is fully engaged within the second socket adapter, the second threaded extension threadably engages the second threaded member to further secure the gas control device to the torch lead.

27. The modular plasma arc torch according to Claim 17 further comprising a torch handle defining positioning ribs, wherein the positioning ribs further secure the torch head to the gas control device and the gas control device to the torch lead.

28. The modular plasma arc torch according to Claim 17, wherein:

the first and second pin fittings define an internal bore and the first and second socket fittings define a distal internal bore and a proximal internal bore, wherein the first pin fitting internal bore is in fluid communication with the socket fitting internal bores, and the second pin fitting internal bore is in fluid communication with the second socket fitting internal bores to conduct the gas through the quick disconnects.

29. A plasma arc torch head for producing plasma within a plasma arc torch comprising:

a quick disconnect member disposed within a proximal end of the torch head,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the plasma arc torch head to and disassembling the plasma arc torch head from a torch component within the plasma arc torch.

30. The plasma arc torch head according to Claim 29, wherein the quick disconnect member is a pin fitting comprising a plurality of resilient fingers defining contact flanges to provide electrical contact for supply of the electric power.

31. The plasma arc torch head according to Claim 30, wherein the pin fitting further comprises an internal bore to conduct the gas.

32. The plasma arc torch head according to Claim 30 further comprising a threaded member disposed adjacent the pin fitting, wherein the threaded member is operable to further secure the plasma arc torch head to the torch component within the plasma arc torch.

33. The plasma arc torch head according to Claim 30, wherein the quick disconnect member is a socket adapter comprising a socket housing and a socket fitting disposed within the socket housing, wherein the gas and electric power are conducted through the socket fitting, and the socket housing insulates the socket adapter from a surrounding environment.

34. The plasma arc torch head according to Claim 33, wherein the socket housing further comprises a threaded extension that is operable to further secure the plasma arc torch head to the torch component within the plasma arc torch.

35. A plasma arc torch head for producing plasma within a plasma arc torch comprising:

a quick disconnect member disposed within a distal end of the torch head,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the plasma arc torch head to and disassembling the plasma arc torch head from a component within the plasma arc torch.

36. A plasma arc torch head for producing plasma within a plasma arc torch comprising:

a quick disconnect member disposed within a proximal end of the torch head; and

a quick disconnect member disposed within a distal end of the torch head,

wherein the quick disconnect members conduct gas and electric power through the plasma arc torch and are operable within a quick disconnect for quickly assembling the plasma arc torch head to and disassembling the plasma arc torch head from components within the plasma arc torch.

37. A plasma arc torch lead for delivering gas and electric power to a plasma arc torch comprising:

a quick disconnect member disposed within a distal end of the torch lead,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the torch lead to and disassembling the torch lead from a torch component within the plasma arc torch.

38. The plasma arc torch lead according to Claim 37, wherein the quick disconnect member is a pin fitting comprising a plurality of resilient fingers defining contact flanges to provide electrical contact for supply of the electric power.

39. The plasma arc torch lead according to Claim 38, wherein the pin fitting further comprises an internal bore to conduct the gas.

40. The plasma arc torch lead according to Claim 38 further comprising a threaded member disposed adjacent the pin fitting, wherein the threaded member is operable to further secure the torch lead to the torch component within the plasma arc torch.

41. The plasma arc torch lead according to Claim 37, wherein the quick disconnect member is a socket adapter comprising a socket housing and a socket fitting disposed within the socket housing, wherein the gas and electric power are conducted through the socket fitting, and the socket housing insulates the socket adapter from a surrounding environment.

42. The plasma arc torch lead according to Claim 41, wherein the socket housing further comprises a threaded extension that is operable to secure the torch lead to the torch component within the plasma arc torch.

43. A plasma arc torch lead for delivering gas and electric power to a plasma arc torch comprising:

a quick disconnect member disposed within a proximal end of the torch lead,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the torch lead to and disassembling the torch lead from a component within the plasma arc torch.

44. A plasma arc torch lead for delivering gas and electric power to a plasma arc torch comprising:

a quick disconnect member disposed within a distal end of the torch lead; and

a quick disconnect member disposed within a proximal end of the torch lead,

wherein the quick disconnect members conduct gas and electric power through the plasma arc torch and are operable within a quick disconnect for quickly assembling the torch lead to and disassembling the torch lead from components within the plasma arc torch.

45. A gas control device for controlling gas flow to a plasma arc torch comprising:

a first quick disconnect member disposed within a distal end of the gas control device; and

a second quick disconnect member disposed within a proximal end of the gas control device,

wherein the first quick disconnect member and the second quick disconnect member conduct gas and electric power through the plasma arc torch and are operable within a quick disconnect for quickly assembling the gas control device to and disassembling the gas control device from torch components within the plasma arc torch.

46. The gas control device according to Claim 45, wherein:

the first quick disconnect member is a pin fitting comprising a plurality of resilient fingers defining contact flanges to provide electrical contact for supply of the electric power; and

the second quick disconnect member is a socket adapter comprising a socket housing and a socket fitting disposed within the socket housing, wherein the gas and electric power are conducted through the socket fitting, and the socket housing insulates the socket adapter from a surrounding environment.

47. The gas control device according to Claim 46 further comprising a threaded member disposed adjacent the pin fitting, wherein the threaded member is operable to further secure the gas control device to one of the torch components within the plasma arc torch.

48. The gas control device according to Claim 46, wherein the socket housing further comprises a threaded extension that is operable to further secure the gas control device to one of the torch components within the plasma arc torch.

49. The gas control device according to Claim 45, wherein:

the first quick disconnect member is a socket adapter comprising a socket housing and a socket fitting disposed within the socket housing, wherein the gas and electric power are conducted through the socket fitting, and the socket housing insulates the socket adapter from a surrounding environment; and

the second quick disconnect member is a pin fitting comprising a plurality of resilient fingers defining contact flanges to provide electrical contact for supply of the electric power.

50. The gas control device according to Claim 49 further comprising a threaded member disposed adjacent the pin fitting, wherein the threaded member is operable to further secure the gas control device to one of the torch components within the plasma arc torch.

51. The gas control device according to Claim 46, wherein the socket housing further comprises a threaded extension that is operable to further secure the gas control device to one of the torch components within the plasma arc torch.

52. A gas control device for controlling gas flow to a plasma arc torch comprising:

a quick disconnect member disposed within a distal end of the gas control device,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the gas control device to and disassembling the gas control device from a component within the plasma arc torch.

53. A gas control device for controlling gas flow to a plasma arc torch comprising:

a quick disconnect member disposed within a proximal end of the gas control device,

wherein the quick disconnect member conducts gas and electric power through the plasma arc torch and is operable within a quick disconnect for quickly assembling the gas control device to and disassembling the gas control device from a component within the plasma arc torch.

54. A quick disconnect for operable engagement of components that conduct gas and electric power comprising:

a pin fitting; and

a socket adapter,

wherein the pin fitting is engaged within the socket adapter such that gas and electric power are conducted through the quick disconnect.

55. The quick disconnect according to Claim 54, wherein:

the pin fitting further comprises a plurality of resilient fingers defining a proximal end and a plurality of contact flanges disposed at the proximal end of the resilient fingers; and

the socket adapter further comprises a socket housing and a socket fitting disposed within the socket housing,

wherein the contact flanges engage the socket fitting to provide electrical contact for supply of the electric power.

56. The quick disconnect according to Claim 55, wherein the socket housing further comprises a tapered internal shoulder that causes the resilient fingers to deflect radially inward for engagement of the contact flanges with the socket fitting.

57. The quick disconnect according to Claim 56, wherein the socket housing further comprises radial bores disposed adjacent the tapered internal shoulder that cause the socket housing to fracture should an object other than the pin fitting be inadvertently forced into the socket adapter.

58. The quick disconnect according to Claim 55, wherein the socket fitting defines a distal internal bore such that the contact flanges engage the distal internal bore for the electrical contact.

59. The quick disconnect according to Claim 58, wherein the socket adapter further comprises a sleeve disposed within the distal internal bore to limit engagement of the contact flanges with the distal internal bore and to facilitate disengagement of the pin fitting from the socket adapter.

60. The quick disconnect according to Claim 55 further comprising a plug disposed on a shoulder formed within the socket fitting, wherein the plug inhibits electrical contact of an object inadvertently inserted within the socket adapter with the socket fitting.

61. The quick disconnect according to Claim 55 further comprising an o-ring disposed between the socket housing and the socket fitting to seal the gas.

62. The quick disconnect according to Claim 55 further comprising an o-ring disposed between the pin fitting and the socket housing to seal the gas.

63. The quick disconnect according to Claim 55, wherein the socket housing further comprises a threaded extension and the quick disconnect further comprises a threaded member, such that when the pin fitting is fully engaged within the socket adapter, the threaded extension threadably engages the threaded member to further the components.

64. The quick disconnect according to Claim 55 further comprising a snap ring disposed around the socket fitting to secure the socket fitting within the socket housing.

65. The quick disconnect according to Claim 55, wherein the pin fitting defines an internal bore and the socket fitting defines a distal internal bore and a proximal internal bore, wherein the pin fitting internal bore, the distal internal bore, and the proximal internal bore are in fluid communication to conduct the gas through the quick disconnect.

66. A quick disconnect for use in connecting torch components within a plasma arc torch comprising:

a pin fitting comprising a plurality of resilient fingers defining a proximal end;

a plurality of contact flanges disposed at the proximal end of the resilient fingers; and

a socket adapter comprising:

a socket housing;

a socket fitting disposed within the socket housing, the socket fitting defining a proximal internal bore and a distal internal bore;

a sleeve disposed within the distal bore of the socket fitting;

a plug disposed between the proximal internal bore and the distal internal bore of the socket fitting; and

a snap ring disposed around the socket fitting, the snap ring securing the socket fitting to the socket housing

wherein the contact flanges engage the distal internal bore of the socket fitting such that gas and electric power are conducted through the quick disconnect, the sleeve limits engagement of the contact flanges within the distal internal bore and facilitates disengagement of the pin fitting from the socket adapter, the plug inhibits electrical contact of an object inadvertently inserted within the socket adapter with the socket fitting, and the torch components may be quickly assembled and disassembled.

67. A quick disconnect member operable within a quick disconnect for operable engagement of components that conduct gas and electric power comprising:

a pin fitting comprising a plurality of resilient fingers defining contact flanges to provide electrical contact for supply of the electric power and a distal internal bore for supply of the gas,

wherein the pin fitting engages an adjacent quick disconnect member such that the components may be quickly assembled and disassembled.

68. The quick disconnect member according to Claim 67 further comprising a threaded member disposed adjacent the pin fitting, wherein the threaded member is operable to further secure the components.

69. A quick disconnect member operable within a quick disconnect for operable engagement of components that conduct gas and electric power comprising:

a socket adapter comprising a socket housing and a socket fitting disposed within the socket housing, wherein the gas and electric power are conducted through the socket fitting, and the socket housing insulates the socket adapter from a surrounding environment.

70. The quick disconnect member according to Claim 69, wherein the socket adapter further comprises a sleeve disposed within the socket fitting to limit engagement of and to facilitate removal of an adjacent quick disconnect member.

71. The quick disconnect member according to Claim 69, wherein the socket housing further comprises a threaded extension that is operable to further secure the components.

72. A quick disconnect member operable within a quick disconnect for operable engagement of components that conduct gas and electric power comprising:

a socket housing defining a tapered internal shoulder and radial bores disposed adjacent the tapered internal shoulder,

wherein the tapered internal shoulder facilitates insertion of an adjacent quick disconnect member and the radial bores cause the socket housing to fracture should an object other than the quick disconnect member be inadvertently forced into the socket housing.

73. The quick disconnect member according to Claim 72, wherein the socket housing further comprises a threaded extension to secure the socket housing to the adjacent quick disconnect member.

74. A quick disconnect member operable within a quick disconnect for operable engagement of components that conduct gas and electric power comprising:

a socket fitting defining a distal internal bore and a proximal internal bore,

wherein the internal bores conduct a supply of gas and the distal internal bore provides electrical contact for an adjacent quick disconnect member such that the socket fitting conducts electric power.

75. A modular plasma arc torch comprising:
a plurality of torch components; and
a plurality of quick disconnects operatively engaged between the torch components,

wherein the torch components are removably connected through the quick disconnects such that the torch components may be quickly assembled and disassembled.

76. The modular plasma arc torch according to Claim 75, wherein at least one quick disconnect comprises:

a pin fitting; and
a socket adapter,

wherein the pin fitting is engaged within the socket adapter such that gas and electric power are conducted through the quick disconnect.

77. The modular plasma arc torch according to Claim 76, wherein the pin fitting defines a plurality of resilient fingers that engage the socket adapter.

78. The modular plasma arc torch according to Claim 76, wherein the socket adapter defines a plurality of fingers defining undercuts, wherein the pin fitting is engaged within the socket adapter.

79. The modular plasma arc torch according to Claim 71, wherein at least one quick disconnect comprises a dual pitch locking connector.

80. The modular plasma arc torch according to Claim 75, wherein at least one quick disconnect comprises:

- a socket member;
- a pin member disposed within the socket member; and
- a locking ring that secures the pin member to the socket member.

81. The modular plasma arc torch according to Claim 80 further comprising:

- a socket housing disposed around the socket member; and
 - a pin housing disposed around the pin member,
- wherein the locking ring secures the pin housing to the socket housing.

82. The modular plasma arc torch according to Claim 75, wherein at least one quick disconnect comprises:

- a socket;
- a canted coil spring disposed within the socket; and
- a pin,

wherein the pin is slidably disposed within the socket and the canted coil spring secures the pin within the socket.

83. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises a torch head.

84. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises an anode, insulator body, and cathode assembly.

85. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises a gas flow control component.

86. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises a torch lead.

87. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises at least one electrical component.

88. The modular plasma arc torch according to Claim 87, wherein the electrical component is a power switch.

89. The modular plasma arc torch according to Claim 87, wherein the electrical component is an electrical circuit that controls a supply of electric power to the modular plasma arc torch.

90. The modular plasma arc torch according to Claim 75, wherein at least one torch component is a plurality of signal and power pins.

91. The modular plasma arc torch according to Claim 90, wherein at least one torch component is a conductive member engaged with the plurality of signal and power pins.

92. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises an adapter that connects a torch lead to a power supply.

93. The modular plasma arc torch according to Claim 75, wherein at least one torch component comprises an adapter provides a connection for a torch head to a torch handle.

94. A modular plasma arc torch handle comprising:

a first handle half;

a second handle half;

at least one flexible tab disposed on the first handle half; and

at least one receptacle disposed on the second handle half,

wherein the flexible tab engages the receptacle to secure the first handle half to the second handle half.

95. The modular plasma arc torch according to Claim 94 further comprising at least one positioning pin disposed on the first handle half and at least one positioning hole disposed on the second handle half, wherein the positioning pin is disposed within the positioning hole to position the first handle half relative to the second handle half.

96. The modular plasma arc torch according to Claim 95 further comprising:

two flexible tabs disposed along an upper periphery of the first handle half;

two receptacles disposed along an upper periphery of the second handle half;

two positioning pins disposed along a lower periphery of the first handle half; and

two positioning holes disposed along a lower periphery of the second handle half.

97. A modular plasma arc torch comprising:
- a torch head;
 - a torch lead; and
 - a quick disconnect operatively engaged between the torch head and the torch lead, the quick disconnect comprising:
 - a pin fitting comprising a plurality of resilient fingers defining a proximal end and a plurality of contact flanges disposed at the proximal end of the resilient fingers; and
 - a socket adapter comprising a socket housing, a socket fitting disposed within the socket housing, and a sleeve disposed within the socket fitting, the sleeve limiting engagement of the contact flanges with the socket fitting and facilitating disengagement of the pin fitting from the socket adapter,
- wherein the resilient fingers are engaged within the socket fitting such that gas and electric power are conducted through the quick disconnect, and the torch head is removably connected to the torch lead through the quick disconnect such that the torch head and the torch lead may be quickly assembled and disassembled.

98. A modular plasma arc torch comprising:
- a torch head;
 - a torch lead;
 - a gas control device;
 - a first quick disconnect operatively engaged between the torch head and the gas control device; and
 - a second quick disconnect operatively engaged between the gas control device and the torch lead, the quick disconnects comprising:
 - a pin fitting comprising a plurality of resilient fingers defining a proximal end and a plurality of contact flanges disposed at the proximal end of the resilient fingers; and
 - a socket adapter comprising a socket housing, a socket fitting disposed within the socket housing, and a sleeve disposed within the socket fitting, the sleeve limiting engagement of the contact flanges with the socket fitting and facilitating disengagement of the pin fitting from the socket adapter,
- wherein the resilient fingers are engaged within the socket fitting such that gas and electric power are conducted through the quick disconnect, the torch head is removably connected to the gas control device through the first quick disconnect, and the gas control device is removably connected to the torch lead through the second quick disconnect such that the plasma arc torch may be quickly assembled and disassembled.

99. A method of assembling a plasma arc torch, the method comprising the step of:

placing a quick disconnect member disposed within a distal end of a torch lead in engagement with a corresponding quick disconnect member disposed within a proximal end of a torch head,

wherein the torch head and the torch lead are quickly assembled.

100. The method according to Claim 99 further comprising the step of:

engaging a threaded member disposed on one of the quick disconnect members with a threaded extension on the corresponding quick disconnect member, wherein the torch head is secured to the torch lead.

101. A method of assembling a plasma arc torch, the method comprising the steps of:

placing a quick disconnect member disposed within a distal end of a torch lead in engagement with a corresponding quick disconnect member disposed within a proximal end of a gas control device; and

placing a quick disconnect member disposed within a distal end of a gas control device in engagement with a corresponding quick disconnect member disposed within a proximal end of a torch head,

wherein the torch head, the torch lead, and the gas control device are quickly assembled.

102. The method according to Claim 101 further comprising the step of:

engaging threaded members disposed on the quick disconnect members with threaded extensions on the corresponding quick disconnect members,

wherein the torch head is further secured to the gas control device and the gas control device is further secured to the torch lead.

103. A method of disassembling a plasma arc torch, the method comprising the step of:

disengaging a quick disconnect member disposed within a distal end of a torch lead from engagement with a corresponding quick disconnect member disposed within a proximal end of a torch head,

wherein the torch head and the torch lead are quickly disassembled.

104. The method according to Claim 103 further comprising the step of:

disengaging a threaded member disposed on one of the quick disconnect members with a threaded extension on the corresponding quick disconnect member prior to disengaging the disconnect member disposed within the distal end of the torch lead from engagement with the corresponding quick disconnect member disposed within the proximal end of the torch head,

wherein the torch head and the torch lead are quickly disassembled.

105. A method of disassembling a plasma arc torch, the method comprising the steps of:

disengaging a quick disconnect member disposed within a distal end of a torch lead from engagement with a corresponding quick disconnect member disposed within a proximal end of a gas control device; and

disengaging a quick disconnect member disposed within a distal end of a gas control device from engagement with a corresponding quick disconnect member disposed within a proximal end of a torch head,

wherein the torch head, the torch lead, and the gas control device are quickly disassembled.

106. The method according to Claim 105 further comprising the step of:

disengaging threaded members disposed on the quick disconnect members from threaded extensions on the corresponding quick disconnect members,

wherein the torch head is unsecured from the gas control device and the gas control device is unsecured from the torch lead.

107. A method of assembling a plasma arc torch, the method comprising the step of:

placing a quick disconnect member disposed within a torch component in engagement with a corresponding quick disconnect member disposed within an adjacent torch component,

wherein the torch components are quickly assembled.

108. A method of disassembling a plasma arc torch, the method comprising the step of:

disengaging a quick disconnect member disposed within a torch component from engagement with a corresponding quick disconnect member disposed within an adjacent torch component,

wherein the torch components are quickly disassembled.